

AFANAS'YEV, N. N.

"Microstructural Fatigue Fractures," Zhurnal Tekhnicheskoy Fiziki, Academy of Sciences USSR, Moscow, No. 10-11, 1944.

AFANASEV, N. N.

AFANASEV, N. N.

G.A. Vol. 39 July 10-Nov. 10, 1961

"Formation of Fatigue Cracks From the Point of View of Microstructure".  
N. N. Afanasev. J. Tech. Phys. (U.S.S.R.) 14, 652-65 (1961)

Armco iron bars (3 mm. x 3 mm.) are periodically examined under the microscope and changes visible on their polished and etched surfaces are noted. The fatigue is accomplished in 3 stages: (a) hardening of the most deformed grains, (b) cracking of these grains along a gliding plane of the crystal, and (c) growth of the crack which sometimes gives rise to a multitude ("rhizoma") of smaller cracks.

11 K

**The Effect of Shape and Size Factors on the Fatigue Strength.**  
N. N. Alinayev. (*A Collection of Papers on the Dynamic Strength of Machine Parts, Academy of Sciences of the U.S.S.R., Institute of Practical Engineering, 1940, pp. 157-167.*) *The Engineer's Digest*, Vol. 5, No. 3, March-April, 1948, pp. 132-136, 625-291 references.

An empirical relation exists between the fatigue limit and the relative stress gradient to which the specimen is subjected. In cases where it is possible to determine the stress gradient and the theoretical stress concentration factor by this theory, it is possible to ascertain the properties of a material by a small series of fatigue tests from which further calculations may be carried out. The equation is suitable for finding the effective stress concentration factor in bending or tensile stressing. Analogous equations for other forms of loading could be derived from the same fundamental principles.

1ST AND 2ND ORDERS										PROCESSES AND PROPERTIES INDEX									
<p><i>M</i></p> <p>The Theory of Fatigue Strength Under Complex Stresses. N. N. Afanas'ev (Zhur. Tekhn. Fiziki, 1946, 16, (4), 443-454).—[In Russian]. A theory has been worked out for real polycrystalline metals, based on the probability of finding the crystals most favourably orientated in relation to the max. shear stresses acting in the metal.—N. A.</p>										<p>1</p>									
ASB.51A METALLURGICAL LITERATURE CLASSIFICATION										COMMON ELEMENTS INDEX									
1ST AND 2ND ORDERS										COMMON ELEMENTS INDEX									

AFANAS'YEV, N.N., doktor tekhnicheskikh nauk; CHERNYAK, N.I., otvetstvennyy redaktor; TITKOV, B.S., redaktor; KRYLOVSKAYA, N.S., tekhredaktor.

[Statistical theory of fatigue strength of metals] Statisticheskaya teoriya ustalostnoi prochnosti metallov. Kiev, Izd-vo Akademii nauk USSR, 1953. 127 p. [Microfilm] (Metals--Fatigue) (MLRA 7:11)

AFANAS'YEV, Nikolay Petrovich; KARPOV, V.V., kandidat tekhnicheskikh nauk,  
nauchnyy redaktor; ROTENBERG, A.S., redaktor izdatel'stva;  
PUL'KINA, Ye.A., tekhnicheskiy redaktor

[Universal dovetailing and milling machine] Universal'nyi shiporezno-  
frezernyi stanok. Leningrad, Gos. izd-vo lit-ry po stroit. i arkhitekt.,  
1957. 29 p. (MIRA 10:7)  
(Woodworking machinery)

DVOSKIN, Lazar' Il'ich; TELESHEV, B.A., prof., red.; AFANAS'YEV, N.P.,  
inzh., red.; SHIKIN, S.T., tekhn.red.; BORUNOV, N.N., tekhn.red.

[Layout and design of high-voltage distribution systems]  
Komponovki i konstruktsii raspredelitel'nykh ustroystv vysokogo  
napriazheniya. Izd.2., perer. i dop. Moskva, Gos.energ.izd-vo,  
1960. 583 p. (MIRA 14:1)  
(Electric power distribution)

FEDOROV, Anatoliy Anatoliyevich. Prinsipal'nyy uchastiyets: AFANAS'YEV, N.P.;  
KAMENEVA, V.V., inzh. GRUDINSKIY, P.G., prof., retsenzents;  
SERBINOVSKIY, G.V., dotsent, retsenzents; BOCHAROV, V.I., dotsent,  
kand.tekhn.nauk, retsenzents; VORONIN, K.P., tekhn.red.

[Electric-power supply of industrial enterprises] Elektrosnabzhe-  
nie promyshlennyykh predpriyatii. Izd.3., perer. i dop. Moskva,  
Gos.energ.izd-vo, 1961. 742 p. (MIRA 14:4)

1. Frunzenskiy politekhnicheskii institut (for Bocharov).  
(Electric power distribution)



AFANAS'YEV, N.P.

Collaboration of the railroad members of the Economic Commission for Europe. Zhel.dor.transp. 44 no.12:74-75 D '62. (MIRA 15:12)

1. Glavnyy ekspert Upravleniya mezhdunarodnykh soobshcheniy Ministerstva putey soobshcheniya. (Railroads—International cooperation)

AFANAS'YEV, N.P., kand, tekhn. nauk; KUZNETSOV, P.T., inzh.

New electrified "Tokaido" express line in Japan. Elek. i topl. tiaga 7  
no. 11:46 N '63. (MIRA 17:2)

AFANASYEV, Nikolay P. (Cand Tech Sci)

"Cybernetics of Railroads."

report presented at the Symp on Use of Cybernetics on Railways, Paris, 4-13  
Nov 63.

Inst of Res for Railway Transportation, Moscow.

AFANAS'YEV, N.P., kand.tekhn.nauk

Comments of an Austrian expert on the railroad transportation of the  
U.S.S.R. Zhel.dor.transp. 46 no.11:90 N '64.

(MIRA 18:1)

New developments in foreign technology. Ibid.:91

AFANASZJEV, N.P., [Afanas'yev, N.P.], a muszaki tudományok kandidátusa (Moscow)

Coordination of the work of transportation branches in the Soviet Union. Kozleked kozl 21 no.3:48-50 17 Ja '65.

ACCESSION NR: AR4015489

S/0169/63/000/012/G005/G005

SOURCE: RZh. Geofizika, Abs. 12G40

AUTHOR: Afanas'yev, N. S.; Zhebrovskaya, T. F.; Pavlovskiy, V. I.

TITLE: Study of the propagation of ultrasound in rocks

CITED SOURCE: Byul. nauchno-tekhn. inform. Gos. geol. kom-t SSSR. Otd. nauchno-tekhn. inform. VIMSa, no. 1 (45), 1963, 45-51

TOPIC TAGS: ultrasound in rocks, propagation of ultrasound, rock samples, seismoscope, elastic properties of rock, vibrations in rock, velocity of sound

TRANSLATION: A determination of the elastic properties of rock taken from sedimentary layers in the KMA [Kursk Magnetic Anomaly] is made. The measurements were made on the UZS-2 seismoscope. Samples were 6-8 cm. The velocity of ultrasound was measured along the layering of the samples and sometimes at right angles to the layering. The mean square error in determining the velocity was  $\pm 45$  m/sec. The following conclusions were made: 1) the propagation speed of elastic vibrations in different rock from sedimentary layers of the KMA depends on the depth of occurrence, the age and structural-lithological peculiarities of the region; 2) for  
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ACCESSION NR: AR4015489

rocks having the same lithological composition and age an increase in velocity with depth of occurrence was noted; 3) the speed of ultrasound in similar rocks with identical depth of occurrence depends on age; 4) a relationship between the speed of ultrasound and density was observed for the rocks which were studied; 5) a different velocity in separate parts of similar rocks does not permit extending the obtained data from one part to another of the rock; 6) a difference in speed values was noted which is obviously connected with the degree of compaction.

DATE ACQ: 09Jan64

SUB CODE: AS, PH

ENCL: 00

Card 2/2

RAZMYSLOVICH, I.R., kandydat tekhnichnykh nauk; ~~AFANAS'YEV, N.V.~~,  
kandydat fizika-matematichnykh nauk; IVANOV, P.N.

Mechanization of checkrow seeding and planting. Vestsi AN  
BSSR no.4:36-50 J1-Ag '54. (MLRA 8:9)  
(Sowing) (Agricultural machinery)



RIVLIN, Mordukh El'yevich; AFANAS'YEV, N.V., kand.istoricheskikh nauk.  
red.; VLASOV, A.V., red.; TIKHONOVA, I.M., tekhn.red.

[Contribution of Leningrad workers to agriculture in the years  
1953-1958] Leningradskie rabochie - sel'skomu khoziaistvu,  
1953-1958 gg. Pod red.N.V.Afanas'eva. Leningrad, Lenizdat,  
1958. 184 p. (MIRA 12:7)  
(Leningrad Province--Collective farms)

SOV/128-59-10-14/24

18(5)

AUTHORS: Afanas'yev, N.V., and Kosyakov, V.F., Engineers

TITLE: Fluidity Tests of Sand Mixes

PERIODICAL: Liteynoye proizvodstvo, 1959, Nr 10, pp 37-40 (USSR)

ABSTRACT: The authors present a new method of fluidity tests on sand mixes. At first, the following known methods were tried out: 1) The AFA method (Ditert); 2) the SFL method ("Soyuzformolit'ye" by P.P. Berg, O.V. Kolacheva and K.V. Krylova); 3) the methods of S.A. Skomorokhov and L.N. Cherkasov; 4) the method of Keyl. The tests showed that the AFA and SFL methods do not enable determination of the regular change of fluidity which depends on a change of the mix composition. For this reason the authors present a new method which is called the method of the BITM (Bryanskiy institut transportnogo mashinostroyeniya (Bryansk Institute of Transport Machine Construction)) (Authors Certification Nr 115309). This method is based on the brittleness of the tested mixes. Figs.9 and 10 show the testing device. 160 g of the mixes which are to be tested are put into the cylinder with a small section. The cylinder with a

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SOV/128-59-10-14/24

Fluidity Tests of Sand Mixes

large section is put over it (Fig.10b). The whole device is put under a laboratory standardized drop hammer with a hammer head of weight  $Q'$ . After this, the device is turned  $180^\circ$ , so that now the top is at the bottom. The small bushing is extracted (Fig.10v) and the device is put under the drop hammer again which pounds three times with the weight  $Q''$  on the top of the cylinder. In the cylinder, there will be a small bushing again and from the clearance  $h$  (Fig.9) the height  $h'$  is determined. The results of the comparative tests are shown in Fig.11. For control purposes, the same tests were conducted under similar conditions and static load. The results are shown in Fig.12. All these results were evaluated statistically (Fig.13). There are 4 diagrams, 9 graphs and 5 references, 4 of which are Soviet and 1 American.

Card 2/2

GOLOVEYKO, A.G. [Holoveiko, A.H.]; AFANAS'YEV, N.V., red.; BLYUM,  
A.G., red.izd-va; KONCHITS, Ye.P., tekhnred.

[Mathematical treatment of experimental data] Matematicheskaya  
obrabotka opytnykh dannykh. Minsk, Redaktsionno-izdatel'skii  
otdel BPI im. I.V.Stalina, 1960. 115 p. (MIRA 13:7)  
(Mathematics)

AFANAS'YEV, N.V., kand.fiz.-matem.nauk

Organizing independent work of students. Sbor. metod. rab. Bel.  
politekh. inst. no. 1:103-108 '59. (MIRA 14:1)  
(Study, Method of)

AFANAS'YEV, N.V.; GOLOVEYKO, A.G.; KORSHUK, G.M.; KUZNETSOVA, Ye.P.,  
red.; KAPRANOVA, N.V., red.izd-va; IZAKOV, Sh.I., tekhn.red.

[Handbook of physics; an aid for first- and second-year  
course students of technical colleges] Spravochnoe posobie  
po fizike; v pomoshch' studentam 1-ykh i 2-ykh kursov tekhnicheskikh vuzov. Minsk, Belorusskii politekhn.in-t. Pt.1.  
1960. 116 p. (MIRA 14:3)  
(Physics--Handbooks, manuals, etc.)

C. A.

Effect of admistures of sulfur on the electric properties of selenium. N. V. Alanas'ky. *Zhur. Tekh. Fiz.* 19, 225-30 (1949).—The elec. cond.  $\sigma$ , in the dark, of cast Se samples

converted to the gray cryst. form by a 3.5-hr. thermal treatment at 184°, increases with increasing S content. Values of  $10^8 \sigma$  (ohm<sup>-1</sup> cm.<sup>-1</sup>) in a field of 3.3 v./cm., with S = 0, 1, 2, 3, 4, 5%, are, at 0°, 2.0, 49.3, 138.5, 224.0, 322.0, 436.0; at 25°, 4.9, 94.9, 232.0, 390.0, 497.0, 605.0; at 40°, 8.2, 135.0, 344.0, 516.0, 715.0, 840.0; at 60°, 13.5, 212.0, 463.0, 736.0, 894.0, 1083.0. Plots of log  $\sigma$  against  $1/T$  are linear, and the activation energies  $U$  of the electron or hole, from  $\sigma = \sigma_0 e^{-U/kT}$ , with 0, 1, 2, 3, 4, 5% S, are, resp., 0.47, 0.38, 0.33, 0.28, 0.25, 0.23 e.v. The coeff. of thermoelec. e.m.f. of couples Cu-Se, with S = 0, 1, 2, 3, 4, 5%, with the hot junction at 30°, is  $\alpha = \Delta E/\Delta T = 0.80, 0.68, 0.65, 0.64, 0.15, 0.11$  mv./degree; at 50°,  $\alpha = 0.92, 0.67, 0.66, 0.64, 0.17, 0.12$ ; at 80°, 0.94, 0.72, 0.67, 0.65, 0.19, 0.13; at 110°, 0.85, 0.73, 0.66, 0.65, 0.19, 0.14. The hot junction has, in all samples, a neg. potential, which indicates defect cond. in all cases, both in pure Se and in Se-S alloys. In microscopic examin., no heterogeneity is detected in samples contg. up to 4% S; a few inclusions are visible with 5% S. Consequently, the distribution of S in its alloy with Se is atomic. The admist. of S creates addnl. energy levels that may be located either near the lower edge of the empty upper zone or just above the upper edge of the lowermost filled zone. In both cases, the energy necessary for the passage of an electron from an impurity level to the empty zone or from the filled zone to an impurity level, must be smaller than the energy of electron transfer from the filled to the conduction zone. This is consistent with the observed variation of  $U$  with the S content. This variation, along with the defect nature of the elec. cond. of Se and Se-S, leads to the conclusion that the impurity levels lie close to the upper edge of the filled zone, and that the S atoms in Se-S are electron acceptors. N. Thon

AFANAS'YEV, N.Y.; MITKEVICH, S.P.

Effect of parameters of the discharging circuit on the extent  
of the electric erosion of metals. Izv. AN BSSR. no.3:127-139  
My-Je '53. (MIRA 9:1)

(Electric discharges)



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А. А. АНАС'ЯВ, Н. В.

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Minsk. Belorusskiy politicheskii institut

Shornik nauchnykh rabot. Vyp. 60: Seriya fiziko-matematicheskaya (Collected Scientific Works. Nr 60: Physics and Mathematics Series) Minsk, 1957. 167. Errata slip inserted. 1,000 copies printed.

Sponsoring Agency: Ministerstvo vysshego obrazovaniya SSSR.

Tech. Ed.: S. Kh. Pesina; Editorial Board: N. A. Bessonov, Docent, Candidate of Physical and Mathematical Sciences (Resp. Ed.); M. V. Popova, Docent, Candidate of Physical and Mathematical Sciences; N. V. Afanas'yev, Docent, Candidate of Physical and Mathematical Sciences; and L. I. Chesnokov, Docent, Candidate of Physical and Mathematical Sciences (Resp. Ed. for this Number).

PREFACE: This book is intended for students of the physical and mathematical sciences. It contains a collection of 19 articles on mathematics, physics, and theoretical mechanics, prepared by members of the Belorussian Polytechnic Institute imeni I. V. Stalin and other scientists. The mathematical material includes an analysis of problems relating to the theory of univalent functions of a complex variable, the boundary problems in the theory of vibrations, and a monograph for the run-off of spring floods. The experimental works include studies of the electroerosion process, crystallization from melts, abrasive polishing of crystals, crystallization in the framework of an amorphous and the elastic properties of a body under its plastic deformation. References follow the individual articles.

8. Litvitskiy, I. M. and N. A. Zhukhovitskiy. Simplifying the Technique of Approximate Calculation of Definite Integrals by Formulas of Numerical Quadratures 56
9. Kheyman, V. B. Monograph for the Formula of G. M. Alexseyev for Calculating the Maximum Run-off of Spring Floods 69
10. Afanas'yev, N. V., A. M. Dushkevich, and A. K. Shukharovich. On the Efficiency of the Electroerosion Process 73
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12. Chesnokov, L. I. Effect of an Electric Field on the Formation of Crystallization Centers in Supercooled Melt 98
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19. Michiporovich, P. V. Studying the Elastic Behavior of a Body During Elastic Deformation 147/4

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E073/E535

26.2310

AUTHORS: Afanas'yev, N. V., Rzhevskiy, M.B. and Franyuk, V.A.

TITLE: On the Mechanism of Electric Erosion

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Fizika,  
1961, No.1, pp.138-142 + 2 plates

TEXT: The results are described of investigations of the product of electric erosion in the case of a high voltage spark discharge in a gaseous medium. Most authors hold the view that electric erosion of metals is caused by thermal effects on the electrodes. However, divergent views have been expressed on the mechanism of removal of material from the electrodes. B. R. and N. I. Lazarenko (Ref.1) assume that the section of the anode hit by the current surge melts away and is torn off the electrode as a result of the dynamic forces. However, E. Williams (Ref.2) considers that an electric field of a high potential which occurs in the erosion gap acts on the positive ions of the crystal lattice and tears away small quantities of metal. B. N. Zolotych (Ref.3) considers that electric erosion is mainly due to the liquid phase and that evaporation is of secondary importance. S.L.Mandel'shtam and S. M. Rayskiy (Ref.4) attribute the electric erosion to the

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On the Mechanism of Electric Erosion

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mechanical destruction of opposing electrodes by the streams of metal vapour which occur as a result of explosive evaporation of the electrode material during the discharge. The authors of this paper investigated the products of electric erosion obtained by means of a high voltage spark discharge in air between electrodes of various metals. The experiments were made with a test-rig shown in Fig.1, in which a bank of condensers 4 of  $C = 2.4 \mu F$  was connected parallel to the spark gap. The voltage fed to the electrodes was 7000 V. A glass plate 5 was placed below the electrodes on which deposits were collected which formed during the spark discharge; after appropriate sparking, the glass plates, containing the erosion product deposits, were photographed and some of the thus obtained photographs are reproduced in the paper. As electrodes the following materials were used: tungsten, nickel, copper, armco iron, aluminium, lead, bismuth, Wood alloy. The obtained photographs indicate that, during the discharge, metal vapours form which condense on the surface of the glass and also a liquid phase which precipitates in the form of spheres of various sizes. The process of electric erosion begins with an intensive

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On the Mechanism of Electric Erosion

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evaporation of the electrode material, as a result of which two flows of particles form which meet in the inter-electrode gap. As a result of collision of the particles, <sup>the</sup> flows become compressed, forming deposits on the glass which have an elliptical shape. The sharply defined boundaries between the individual zones observed on the photographs are attributed to the oscillatory nature of the discharge which was established by means of an oscillograph; clear boundaries of areas with different densities may have formed as a result of precipitation of vapours from the electrodes during the first, second and third half-wave of the current flow. Absence of vapours in the centre zone was observed on plates which were located very near to the discharge axis and this is attributed to the fact that in this zone the glass plate was heated to a temperature which was higher than the condensation temperature of the vapours. The subsequent zone was formed as a result of super-position of several flows of vapour particles during the first, second and third current half-waves and in this zone no trails of movement of spheres can be seen. In the subsequent zone, these traces can be clearly seen since the vapours condense on dropping into the lower temperature area condensing and forming small spheres which drop onto the plate

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On the Mechanism of Electric Erosion

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and slide along the vapour layer deposited on it, leaving behind trails of its movement. Spheres of this type could form only after the first half-wave when the electrodes already had small craters caused by evaporation of the metal. The surface layer of such craters will still have a high temperature during the subsequent current half-wave when its temperature rises still further, evaporating a part of the metal and, due to the pressures in the spark gap, a part of the liquid phase will be squeezed out in the form of spheres of various diameters which scatter in all directions; therefore, these spheres and their traces can be detected in all the areas of the deposits on the glass plates. Due to the presence of spheres of this latter type, the views of Williams and Zolotikh that removal of the solid or liquid phase from the electrode is caused by the electrostatic forces seem to be incorrect. If they were true the particles would move approximately along lines of force of the field and in this case they would deposit only on the opposite electrodes; in reality, however, the trajectories of the particles form a large scattering angle relative to the discharge axis which may reach 80 to 90°. The views of Mandel'shtam and Rayskiy, who assume that the destruction of the electrodes occurs

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On the Mechanism of Electric Erosion S/139/61/000/001/014/018  
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due to the effect of the jets emanating from the opposing electrodes, are also unacceptable, since the obtained photographs of the erosion product deposits show that the flow of particles from the electrodes do not penetrate into each other but, on the contrary, they repulse each other. The results indicate that, during a discharge, electrode material is removed, not only in the gaseous but also in the liquid phase. The following conclusions are arrived at: 1) In the case of a condensed high voltage spark discharge in a gaseous medium, the flow of particles emanating from the electrodes represents a two-phase system containing a liquid and a gaseous phase. This applies to low melting point as well as to high melting point metals. 2) The intensity of the flow of particles emanating from the electrodes during the discharge depends on the material of the electrodes; from low melting point metals the intensity of flow is larger than for high melting point metals. 3) Evaporation of the metal from the electrodes takes place throughout the entire time of the discharge. Abandoning the electrodes in the gaseous phase the metal condenses and scatters in the surrounding medium in the form of fine spheres.

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On the Mechanism of Electric Erosion

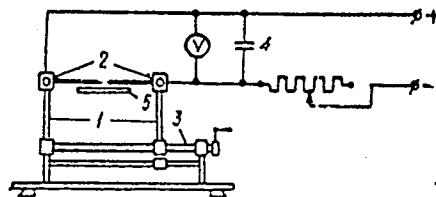
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4) In the liquid phase the metal is removed from the electrodes after the first or the second current half-wave. Removal of the liquid phase does not occur as a result of tearing out of the metal but as a result of the high pressures pertaining in the discharge canal. 5) The vapour streams emanating from the electrodes cannot produce mechanical destruction of the counter electrode since they meet in the gap centre and compress each other. 6) Electric erosion products of metals contain spheres which form as a result of condensation of metal vapours and spheres which form as a result of being squeezed out from the liquid phase of the craters. There are 8 figures and 4 references: 3 Soviet and 1 non-Soviet.

ASSOCIATION: Belorusskiy politekhnicheskii institut imeni I.V. Stalina (Belorussian Polytechnical Institute imeni I. V. Stalin)

SUBMITTED: September 24, 1959

Fig.1



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E194/E484

AUTHORS: Afanas'yev, N.V., Metsik, M.S.

TITLE: The nature of dielectric loss in crystals of  
phlogopite mica

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy. Fizika.  
no.6, 1961, 132-140

TEXT: The present article gives preliminary results of a study of the dielectric properties of phlogopite mica as function of pressure and general considerations are given concerning the mechanism of dielectric loss and polarization in phlogopite crystals. Pressure was applied to the specimens through a mechanical system of levers and could reach values of some hundreds of  $\text{kg/cm}^2$ . Changes in specimen thickness during heating were measured with a micrometer head. The electrodes consisted of metallic silver deposited on the mica in vacuum. The specimen was placed between silvered steel discs which served both to make contact and to apply pressure to the specimen. The dielectric loss angle and capacitance of the specimen were measured at various frequencies in the range 50 c/s to 1.7 Mc/s using bridges types Card 1/15

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The nature of dielectric loss ...

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МДП (MDP) and МЛЕ-1 (MLYe-1) and Q-meter type КВ-1 (KV-1).  
In one series of tests measurements were made of capacitance and dielectric loss angle of phlogopite as function of temperature at constant pressure using various pressures in the range 1 to 300 kg/cm<sup>2</sup>. In a further series of tests the sample was heated to a certain temperature under a pressure of 300 kg/cm<sup>2</sup> and then, at constant temperature, measurements were made of capacitance and dielectric loss angle as function of pressure as the pressure was reduced to a few mm of mercury. All the results were obtained on a single specimen of Aldan phlogopite mica of medium hydration. The thickness of the specimen was 185 microns. The measurements were made after the sample had already been heated once, in which condition changes in dielectric loss angle and capacitance with change of pressure are practically reversible. The electric field was applied perpendicular to the plane of cleavage. Graphs of capacitance and tan  $\delta$  for various pressures at a frequency of 0.5 Mc/s are shown in Fig.2, where 1,1' - tan  $\delta$  and capacitance at a pressure of 1.2 kg/cm<sup>2</sup>; 2,2' - 9.5 kg/cm<sup>2</sup>; 3,3' - 50 kg/cm<sup>2</sup>; 4,4' - 300 kg/cm<sup>2</sup>; 5 - swelling as function of temperature at a Card 2/75 ✓

The nature of dielectric loss ...

S/139/61/000/006/017/023  
E194/E484

pressure of 1.2 kg/cm<sup>2</sup>; 6 - same at pressure of 9.5 kg/cm<sup>2</sup>; 7 - product of capacitance and tan  $\delta$  at a pressure of 1.2 kg/cm<sup>2</sup>. It is evident from the curves that the dielectric effects are directly associated with swelling of the mica. At sufficiently high pressures (300 kg/cm<sup>2</sup>) the phlogopite practically does not swell in the temperature range considered and then tan  $\delta$  and capacitance are substantially independent of temperature. The influence of pressure and the associated swelling on dielectric properties are clearly seen in isotherms of tan  $\delta$  and capacitance plotted as function of pressure in Fig.3, where 1,1' - tan  $\delta$  and capacitance at a frequency of 0.5 Mc/s; 2,2' - same for 10 kc/s; 3,3' - same for 50 c/s. The tests were made at a temperature of 230°C; the sample was heated under a pressure of 300 kg/cm<sup>2</sup> which was afterwards reduced to atmospheric without changing the temperature. It is noticed, and most clearly at the higher frequency, that there is a critical pressure below which the capacitance commences to fall, and tan  $\delta$  commences to increase, as the pressure is reduced. For a frequency of 0.5 Mc/s this critical pressure is 30 kg/cm<sup>2</sup>, which is close to the saturated vapour pressure of steam at 230°C which is 28.5 kg/cm<sup>2</sup>.

Card 3/5

The nature of dielectric loss ...

S/139/61/000/006/017/023  
E194/E484

Measurements were also made at various frequencies with a constant pressure of  $1.2 \text{ kg/cm}^2$  and it is found that whilst at high frequencies the temperature at which the  $\tan \delta$  is a maximum is practically constant, at audio-frequencies this maximum is displaced towards higher temperatures as the frequency is reduced. It is quite evident that the electrical effects observed are associated with the effect of swelling which is accompanied by the formation in the crystal of lens shaped spaces filled with water vapour. The steep part of the swelling curve corresponds to a condition in which the spaces contain saturated steam in equilibrium with a water film adsorbed on the surface. In the flatter part of the swelling curve the spaces have swelled and the steam is unsaturated. It is concluded that the changes in the dielectric properties of phlogopite mica during swelling can be explained by polarization between the layers of phlogopite due to the presence in them of combined water which, on heating, is concentrated into the lens shaped spaces. There are 5 figures and 18 references: 17 Soviet-bloc and 1 non-Soviet-bloc.

Card 4/0 5

The nature of dielectric loss ...

S/139/61/000/006/017/023  
E194/E484

ASSOCIATION: Irkutskiy gosuniversitet im. A.A.Zhdanova  
(Irkutsk University imeni A.A.Zhdanov)

SUBMITTED: November 10, 1960

Card 5/5

AFANAS'YEV, N.V.; KOSYAKOV, V.F.

Device for determining the flowability of molding mixtures.

Lit. proizv. no.1:19-20 Ja '62.

(MIRA 16:8)

(Sand, Foundry---Testing)

45007

S/139/62/000/006/011/032  
E194/E155

151650

AUTHORS: Afanas'yev, N.V., Popova, V.N., and Metsik, M.S.

TITLE: Dielectric properties of phlogopite mica crystals in the direction of cleavage

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Fizika, no.6, 1962, 64-71

TEXT: The dielectric properties of phlogopite mica were studied in the direction of cleavage to provide application data and because nearly all previous measurements have been made across the cleavage direction. The specimens were from mica crystals about 4 cm thick held in clamps and cut to 0.25 cm thick in the direction of cleavage. The ends of the specimens were polished and silvered electrodes of 2.44 cm diameter were deposited on them. With the specimens held in moist air and in vacuum at various temperatures in the range  $-100$  to  $+350$  °C, the permittivity  $\epsilon'$  and the loss factor  $\epsilon'' = \epsilon' \tan \delta$  were measured in the frequency range 50 c/s to 1.6 Mc/s using a Schering bridge or Q-meter, and resistivity  $\rho$  was also measured. A dispersion region occurs in the low frequency range and is attributed to the presence of

Card 1/2

Dielectric properties of phlogopite... S/139/62/000/006/011/032  
E194/E155

conducting surfaces in the cleavage planes of the crystal, which are 'open' in the sense of being in communication with the ambient medium. A second dispersion region, which occurs in the radio and sonic frequency ranges at room temperature, is attributed to 'closed' regions. As the sample becomes wetter the two regions run together and  $\epsilon''$  and  $\epsilon'$  reach high values (several hundred). As the samples are dried the regions separate and the dielectric properties improve. Finally, when the water adsorbed in the cleavage planes and other inclusions (for example ionic contamination which contributes to conductivity) have been removed, the dielectric properties become the same in the direction parallel to cleavage as in that perpendicular to it. There are 5 figures and 2 tables.

ASSOCIATION: Irkutskiy gosuniversitet imeni A.A. Zhdanova  
(Irkutsk State University imeni A.A. Zhdanov)

SUBMITTED: September 25, 1961

Card 2/2



METSIK, M.S.; AFANAS'YEV, N.V.

Calculating the dielectric constant of mica crystals. Izv. vyb.  
ucheb. zav.; fiz. no.1:104-106 '64. (MIRA 17:3)

1. Irkutskiy gosudarstvennyy universitet imeni A.A.Zhdanova.

ACCESSION NR: AT4012872

S/3060/63/000/000/0134/0138

AUTHOR: Afanas'yev, N. V.; Goloveyko, A. G.

TITLE: Abrasive properties of the erosion products of steel obtained during electric spark machining

SOURCE: AN SSSR. Tsentr. n.-i. lab. elektr. obrabotki metallov. Elektroiskrovaya obrabotka metallov. Moscow, 1963, 134-138

TOPIC TAGS: electric spark, machining, spark discharge, steel erosion product, abrasive property, electrical metal finishing, steel machining

ABSTRACT: The fine particles of steel which are dispersed during electric spark machining in carbon-containing lubricants (kerosene, etc.) are subject to rapid temperature changes and hence to carbonization and subsequent hardening. Thus, the particles may have abrasive properties. The materials investigated in this report were steels 40Kh, 2Kh13, P18, the alloy T15K6, and the carbides of boron and silicon. The dispersion was accomplished by a spark discharge machine working at 200 volts, 5 amps, 200 pfarads in kerosene from which the particles were recovered by a benzene and acetone bath. The abrasive properties were investigated by insertion of 100 g of pulverized material between a stationary glass disc and

Card 1/4

ACCESSION NR: AT4012872

revolving hardened steel disc and the abrasion of the glass disc was measured after each 3000 revolutions. The data shows that for all materials the total abrasion of glass varies linearly with the number of revolutions up to 12,000 revolutions. The abrasive properties of various materials became essentially zero after the number of revolutions indicated below:

Silicon carbide	300,000	Steel 40Kh	45,000
Boron carbide	33,000	Steel P18	69,000
Alloy T15k6	42,000	Steel 2Kh13	More than 120,000

Even though the abrasion intensity (milligrams of glass/revolution) of carbides is initially much higher than that of the spark discharge erosion products, a number of revolutions,  $n_0$ , are given in Table 1 of the Enclosure. When total abrasion of materials is compared (large number of revolutions), it becomes evident that the abrasion of 2Kh13 steel becomes greater than that of silicon carbide after 45,000 revolutions and greater than that of boron carbide after 97,000 revolutions, and the total abrasion of T15K6 and 40Kh never exceeds that of carbides. A similar test performed with ordinary 2Kh13 pulverized steel showed that only the electrical spark discharge erosion products possess abrasive properties. Hardness of the erosion products of 2Kh13 steel was measured to reach 47000 kg/mm<sup>2</sup> and exceeded the hardness of the original material by five times. Orig. art. has: 4 figures, 1 table and 3 formulas.

Card 2/4

ACCESSION NR: AT4012872

ENCLOSURE: 01

Tested Metallic Powder	$\eta_o$ , Compared to Boron Carbide	$\eta_o$ , Compared to Silicon Carbide
2Kh13	21,000	15,000
P18	21,000	21,000
40Kh	27,000	27,000
T15K6	27,000	27,000

Table 1

Card 4/4

L 25242-65 ENT(1)/KPA(8)-2/ENT(4) FI-12/CI-4 11/1/61 30

67-10895-15-224, 25

AUTHOR: Afanasyev, N. V. | Metsik, M. G.

TITLE: Nature of dielectric losses in flogopite crystals

CITED SOURCE: Izv. Leningr. elektrotekh. in-ta, 1963, No. 51, 220-220

TOPIC TAGS: mica, flogopite

**TRANSLATION:** Variation in the dielectric characteristics of flgopite as a result of heating is due to a bulging phenomenon and associated formation of water-filled cavities in the crystal. With increasing temperature, the amount of flgopite are transformed from flgopite to a mixture of flgopite and water. The dielectric characteristics of a material, as the flgopite, are affected by the presence of water. Associated dielectric-characteristics of flgopite at various temperatures. Measurements within 50 cps — 10<sup>7</sup> Mc/sec. are reported for pressures up to 100 kg/cm<sup>2</sup> and with a pressure of 0—300 kg/cm<sup>2</sup> are reported. Five illustrations.

**Bibliography:** 15 titles.

SUB CODE: SS,EM

ENCL: 00

Card 1/1

L 04256-67 EWT(1) IJP(c) GG

ACC NR: AR6010516

SOURCE CODE: UR/0196/65/000/010/B014/B014

AUTHOR: Afanas'yev, N. V.; Metsik, M. S.; Popova, V. N.

TITLE: Interlayer polarization and <sup>2/</sup>dielectric losses in crystals of phlogopite mica

SOURCE: Ref. zh. Elektrotehnika i energetika, Abs. 10B72

REF SOURCE: Sb. Probov dielektrikov i poluprovodnikov. M.-L., Energiya, 1964, 346-351

TOPIC TAGS: dielectric material, dielectric property, dielectric loss, dielectric crystal, mica

ABSTRACT: The specific inductive capacitance, loss factor, and resistance of phlogopite of different hardnesses are studied. Experimental data obtained indicate that in phlogopite crystals there are two types of foliations: open (communicating with the atmosphere) and closed. Because of surface conductivity, these foliations lead to interlayer polarization, causing a deterioration in the dielectric properties of the mica. Open foliations determine the field of dispersion and absorption, which is located basically in the range of sonic and radio frequencies. The specific inductive capacitance and the loss factor, determined by open foliations in the direction of a cleavage at 50 cps, may reach  $10^2$  for hard phlogopite and  $10^4$  for soft phlogopite. The drop in specific inductive capacitance as a direct function of frequency and the frequency

Card 1/2

UDC: 621.315.613.1.011.5

L 04256-67

ACC NR: AR6010516

maximum of the loss factor in the direction of cleavage increases from several units for hard phlogopite to several hundred units for soft phlogopite. The foliations cause a deterioration in the electrical properties of the phlogopite also in a direction perpendicular to the planes of cleavage. In this direction, the specific inductive capacitance does not essentially depend upon hardness and is close to six, and the frequency maximum of the loss factor associated with closed foliations is of the order of  $10^{-2}$  and is determined chiefly by the transverse dimension of the foliations rather than by hardness. The swelling of phlogopite when heated and the deterioration in dielectric properties associated with it may be eliminated by pressure greater or equal to the pressure of saturated water vapor at the working temperature. The concentration of closed foliations for phlogopite of average hardness is of the order of  $10^6 \text{ cm}^{-3}$ , and the thickness of electrolytic water films in closed foliations is of the order of  $10^2$ - $10^3$  monolayers, while the specific resistance of the films at room temperature is  $10^4$ - $10^5$  ohm/cm. Translation of abstract 5 illustrations and bibliography of 5 titles. Irkutsk State University (Irkutskiy gosudarstvennyy un-t) A. Petrashko

SUB CODE: 11,20

Card 2/2 fv

AFANAS'YEV, N.V.; MAYDANOV, M.P.

Sand cooling equipment. Sbor. trud. BITM no.22:41-50 '64.  
(MIRA 18:6)



3266-35 EWT(m)/EWP(V) EWT(q)/EWP(V) 00-1 1/2 1/2 1/2 1/2  
 ACCESSION NR: APL020382 5/0250/64/008/002/0097/0100

AUTHORS: Afanas'yev, N. V.; Vorobey, Z. F.; Kuznetsova, Ye. P.

TITLE: Effect of pulse pressure on magnitude of electric corrosion on metals.

SOURCE: AN BSSR. Dokladya, v. 8, no. 2, 1974, 94-100.

TOPIC TAGS: electric corrosion, electrode, arc discharge, capacitor bank, surface evaporation

ABSTRACT: The electrical corrosion of electrodes at high and low pressures has been investigated both in air and in water. Pulse pressures were obtained in distilled water through arc discharges between two electrodes from a capacitor bank with  $C = 100 \text{ nF}$  on 2000 volt potential. The pressure ranged from 100 atm, and the electrodes were made of Fe, Ni, Cu, Zn, and Al. The results show lowest corrosion in air, followed by open surface without discharge in water under high pressure. With the exception of Sn and Al, the corrosion in water was up to 10 times as great as in air. The results show that discharge energy and characteristics were independent of the material used as electrode. It is believed that the extent of high pressure corrosion, caused by metallic surface evaporation, is determined by the thermophysical properties of the material. Orig. and trans. in Russian.

6969-65

ACCESSION NR: APH020382

ASSOCIATION Belorusskiy politekhnicheskii institut (Byelorussian Polytechnical  
Institute)

SUBJECT (15 May 63)

ENCL 00

SUB CODE

NO REF 5077 007

OTHER 001

AFANASYEV, N.V.

New method of compacting a core mixture in the core box with  
a flow of compressed air or carbon dioxide. Sbor. trud. BITM  
no.22:51-61 '64. (MIRA 18:6)

AFANAS'YEV, N.V.; IL'IN, A.S.; KATONOV, P.A.

Investigating the performance of a slinger head with a  
tangential sand mixture feed. Sbor. trud. BITM no.22:  
62-66 '64. (MIRA 18:6)

DZYUBA, M.Ye., red.; POTREKHIN, N.M., red.; AFANAS'YEV, N.Ye., red.;  
KOMOV, V.Ye., red.; SOLDATOV, I.I., red.; NEMYTOV, V., tekhn.red.

[Forty years; development of the economy and culture of Orlov  
Province] Za sorok let; materialy o razvitii ekonomiki i kul'tury  
Orlovskoi oblasti. Orel, Izd-vo "Orlovskaya pravda," 1957. 241 p.  
(MIRA 11:5)

(Orlov Province--Economic conditions)

S/109/62/007/005/014/021  
D230/D308

9.2574

AUTHORS: Shteynshleyger, V.B., Mizezhnikov, G.S., and Afanasyev, O.A.

TITLE: The efficiency of various pumping methods in travelling wave quantized paramagnetic amplifiers using a ruby

PERIODICAL: Radiotekhnika i elektronika, v. 7, no. 5, 1962, 874 - 879

TEXT: Various quanta gaps can be employed in three-level solid state travelling wave masers, following the variant described by R.W. De Grasse et al (Bell Syst. Tech. J., v. 38, no. 2, 1959, 305). The authors investigate the combination of pumping action on the 1-4 level with simultaneous action of auxiliary saturated microwave fields at two frequencies corresponding to 1-3 and 3-4 levels. Formulas for the paramagnetic gain coefficient  $G_{\text{p}}$  and inversion coefficient  $p$  in terms of the slow-wave system length, wavelength in free space, group velocity retardation, magnetic decrement and paramagnetic absorption decrement are derived and discussed. Expressions for  $p$  for the above mentioned energy levels are established. Card 1/2

SHTEYNSHLEYGER, V.B.; AFANAS'YEV, O.A.; MISEZHNIKOV, G.S.; ROZENBERG, Ya.I.

Quantum paramagnetic traveling-wave amplifier of high  
efficiency. Prib. i tekhn. eksp. 9 no.5:136-138 S-O '64.  
(MIRA 17:12)

L 16075-65 EWT(d)/CWT(1)/EEC(b)-2/EWA(h) Pn-4/P1-4/P1-4/Pac-4/Peb SSD/ESD(t)/  
ESD(c)/ESD(gs)/SSD/ESD/AFWL/ASD(a)-5/AFETR/AFTC(p)/RAEM(a)  
ACCESSION NR: AP4047476 120/64/000/005/0136/0138

AUTHOR: Shteynshleyger, V. B.; Afanas'yev, D. A.; Misezhnikov, G. S.; Rozenberg,  
Ya. I.

TITLE: Traveling-wave paramagnetic amplifier with increased efficiency

SOURCE: Pribery\* 1 tekhnika eksperimenta, no. 8, 1964, 136-138

TOPIC TAGS: maser, paramagnetic amplifier, traveling wave paramagnetic amplifier,  
laser

ABSTRACT: This maser was described in part in a previous article by two of the authors. The present article gives the following characteristics of the amplifier: 1) it operates at a temperature of 4.2K, i.e., without the pumping-out of helium; 2) the delay system, which is 115 mm in length, is located in a metallic cryostat placed between the poles of the permanent magnet. Magnetization windings placed on the poles are used for accurate setting of the magnetic field intensity. Signal and pumping cryostat output waveguides are fixed to the top of the cryostat. It was found that the highest coefficient of inversion is obtained when transition 1-4 is used for pumping. At 22 Mc the resultant paramagnetic amplification was 28 db. Noise temperature calculated on the basis of measurement data was 15K. A des-

Card 1/2



L 16075-65

ACCESSION NR: AP4047476

0

cription is also given of the ferrite isolator used in the system to eliminate regenerative effects. The isolator was made of polycrystalline nickel-zinc ferrite-chromite whose saturated magnetic field at 4.2K was 4200 oe. Orig. art. has: 1 figure.

ASSOCIATION: none

SUBMITTED: 27Jun63

ENCL: 00

SUB CODE: EC

NO REF SOV: 004

OTHER: 002

Card 2/2

AFANAS'YEV, O.D., tekhnik.

Using type O-49 current converters for compounding devices of small capacity synchronous generators. Energetik 5 no.3:23-24 Mr '57.  
(MIRA 10:3)

(Electric generators)

14(6)

SOV/91-59-5-13/27

AUTHOR: Afanas'yev, O. R., Technician

TITLE: Self-Synchronization of Diesel-Generators (Samos-inkhronizatsiya dizel-generatorov)

PERIODICAL: Energetik, 1959, Nr 5, pp 24-25 (USSR)

ABSTRACT: An unidentified power plant has introduced self-synchronization of switching-on its 6D 30/50, 64 36/45, DDKh-8 "Vortington" and MAN-530 64 42.5/60 diesel generators, which is briefly described in this article.

Card 1/1

AFANAS'YEV, O.O. [Afanas'iev, O.O.]; GORVITS, S.M. [Horvits, S.M.];  
IGNATOVA, L.P. [Ihnatova, L.P.]; KOTOV, M.P.; NOVIK, G.B.  
[Novyk, H.B.]; ORLOV, I.V.; PEYSAKHZON, L.B.; ROZENMAN, G.S.  
[Rozenman, H.S.]; SKATERNY, V.A.; TSITRIN, L.I.; CHECHENEV,  
M.I. [Checheniev, M.I.]; SHOSTAK, S.I.; NAZARENKO, N., red.;  
GORKAVENKO, L. [Horkavenko, L.], tekhn.red.

[Light industry of the Ukraine] Lehka promyslovist' Ukrainy.  
Kyiv, Derzh.vyd-vo tekhn.lit-ry URSR, 1960. 197 p.

(MIRA 14:4)

(Ukraine--Industries)

L 53894-65 EWT(m)/EPF(c)/T/EWP(1) PC-L/PT-L RM

ACCESSION NR: AP5014154

5 180.65/038/005/0987/0987  
14.1.193+546.18

AUTHOR: Zel'venskiy, Ya. D.; Yefremov, A. A.; Afanas'yev, O. P.

TITLE: Adsorptive purification of trichlorosilane containing traces of phosphorus

SOURCE: Zhurnal prikladnoy khimii, v. 38, no. 5, 1965, 987-992

TOPIC TAGS: adsorptive purification, purification, trichlorosilane, phosphorus ad-  
sorption, adsorbent

ABSTRACT: Purification of trichlorosilane containing phosphorus using several com-  
mercial adsorbents and radioactive tracer method. Trichlorosilane containing  $P^{32}$  was  
studied in both liquid and vapor phases. In the case of the liquid phase, adsor-  
bents used were: A-1 alumina, ASM and KSM silicagels, CKT and EAL charcoals, and  
NaX synthetic zeolite. Adsorption capacity of these materials for phosphorus was  
measured at 20°C and  $PCl_3$  concentrations in trichlorosilane ranging from 1 to  $10^{-2}\%$ .  
For the liquid phase operation the specific purifying capacity (in kilograms per  
kilogram) of the adsorbents is as follows: A-1 alumina = 4300, ASM silicagel = 24,  
CKT charcoal = 4.4, and KSM silicagel = 1.4. In the case of the vapor phase, ad-

Card 1/2



AFANAS'YEV, O.Ye., inzh.

Devote more attention to specialized control machines.

Avtom., telem. i svyaz' 7 no.10:23 0 '63.

(MIRA 16:11)

AFANAS'YEV, O.Ye., inzh.; GRITSEVSKIY, P.M., inzh.

Use of ferromagnetic materials in automatic control systems  
and computer engineering. Avtom., telem. i sviaz' 9 no.3:4-8  
Mr '65. (MIRA 18 :11)



L 3005-66 EWT(d)/ENP(v)/ENF(k)/ENP(h)/ENP(l)

ACCESSION NR: AP5024858

UR/0231/65/000/005/0054/0059  
656.22--52:681.142--523.8

AUTHORS: Afanas'yev, O. Ye. (Engineer); Bobrov, A. Ye. (Engineer)

TITLE: Questions of the development of a specialized machine control device

SOURCE: Moscow. Vsesoyuznyy nauchno-issledovatel'skiy institut zheleznodorozhnogo transporta. Vestnik, no. 5, 1965, 54-59

TOPIC TAGS: automatic control, automatic control equipment, transportation, transport process, computer control, computer, digital control system

ABSTRACT: A possible structuring of a special-purpose control machine is studied. This machine is based upon the use of the microprogramming principle of constructing a control device with elements of multiprogramming work. The authors describe the working of a special machine control device under the execution of a typical block of program instructions. The case studied is that of automated regulation of the movement of trains by a dispatcher's section. The mathematical algorithm for optimal dispatching was developed and tested in the department of "Automatics and Telemechanics" of LIIZhT (Leningrad Institute of Railroad Transport Engineers). The algorithm is described by A. Zav'yakov (Programirovaniye

Card 1/2

AFANAS'YEV, P., inzh.; BORODICH, M., inzh.; VISHNYAKOV, Ye., inzh.

Making wire-reinforced concrete girders on stands. Na stroi. Ros.  
3 no.5:37 My '62. (MIRA 15:9)  
(Beams and girders)

AFANAS'YEV, P.

Construction in the Far North. Sel'.stre1. 11 no.3:11-12 Mr '56.  
(MLRA 9:7)

1.Predsedatel' ispolkoma Magadanskogo oblastnogo Soveta deputatov  
trudyashchikhsya.  
(Russia, Northern--Building)

107-57-4-7/54

AUTHOR: Afanas'yev, P., Minister of Communications, BelSSR

TITLE: For More Economical Rural Radio (Za udeshevleniye radiofikatsii sela)

PERIODICAL: Radio, 1957, Nr 4, p 7 (USSR)

ABSTRACT: According to the directives of the 20th Communist Party Congress, every kolkhoz is to have a wire-broadcast loudspeaker or a radio receiver by 1960. There were about 1,300 wire-broadcast stations in the BelSSR in 1957. In 1955, 506 kolkhozes of Belorussia were equipped with radios, and in 1956, 649 kolkhozes. So far, however, only one-half of the Belorussian kolkhozes have radio receivers or wired loudspeakers. Under present conditions of supply of line materials, the radio program may conceivably remain unfinished by 1960. Wire-broadcast lines are not being built by the most economical methods. Two types of line have been used in wire-broadcast networks: (1) an overhead two-wire pole line, or (2) an underground-type PRVPM cable line. One kilometer of the overhead line is three times as expensive as one kilometer of the underground cable line. Overhead lines are more expensive in operation and are particularly disadvantageous in populated areas. In BelSSR, however, only 25% of all lines under construction are cable lines. The reason for this

Card 1/3

107-57-4-7/54

**For More Economical Rural Radio**

The Ministry of Communications, USSR, should insist on producing greater quantities of the PRVPM cable.

Card 3/3

AFANASYEV, P.																									
1ST AND 2ND GROUPS													3RD AND 4TH GROUPS												
<p>Ca</p> <p>13</p> <p>The purification of gases from arsenic by an adsorption method. P. Afanasyev. <i>J. Chem. Ind. (Moscow)</i> 1933, No. 5, 30-43.—When air contg. <math>As_2O_3</math> is passed over <math>SiO_2</math> gel, adsorption is favored by lower temps. Increase in the concn. of <math>As_2O_3</math> increases the amt. of adsorption before the material begins to pass through the gel. At 250° and a concn. of 0.85% <math>As_2O_3</math> the gel adsorbs 59.9% <math>As_2O_3</math>, while under similar conditions it adsorbs only 6.8% <math>H_2SO_4</math>. The gel may be regenerated by passing a current of air heated to 150-375° over the gel, in which case, 63% of the <math>As_2O_3</math> is removed, or by twice extg. with <math>H_2O</math> at 60°, which removes 98.1% of the <math>As_2O_3</math>.</p> <p>H. M. Leicester</p>																									
<p>AS 53.4 METALLURGICAL LITERATURE CLASSIFICATION</p>																									

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50
										1ST AND 2ND COPIES										3RD AND 4TH COPIES																													
<div style="display: flex; justify-content: space-between;"> <span>CA</span> <span>18</span> </div> <div style="text-align: center;"> <p>PROCESSES AND PROPERTIES INDEX</p> <p>AFANAS'YEV, P.A.</p> <p>Contact apparatus for the manufacture of sulfuric anhydride. P. A. Afanas'yev. Russ. 42,035, Mar. 31, 1935. Construction details.</p> </div>																																																	
<div style="display: flex; justify-content: space-between;"> <span>ADDITIONAL LITERATURE CLASSIFICATION</span> <span>124: 03417</span> </div> <div style="display: flex; justify-content: space-between;"> <span>124: 03417</span> <span>124: 03417</span> </div>																																																	

AFANAS'YEV, P.A.

15

Washing and cooling gases containing sulfur dioxide.  
P. A. Afanas'ev and Z. P. Rozenknop. Russ. M, 801,  
April 30, 1937. The gases are washed with  $H_2SO_4$ , which  
is passed through the washing app. once and in such amt.  
that after the process it contains at least 0.5%  $H_2SO_4$ .

ASM. S. A. METALLURGICAL LITERATURE CLASSIFICATION



1ST AND 2ND ORDERS										1ST AND 2ND ORDERS									
PROCESSING AND PREPARATION INDEX																			
<p>CA AFANAS'YEV, P.A.</p>																			
<p>Contact apparatus for the oxidation of sulfur dioxide. P. A. Afanas'ev and N. F. Yushkevich. Russ. 53,470. Jan. 31, 1938. The gas is cooled by passing it through coolers arranged in parallel series.</p>																			
<p>ASH-SLA METALLURGICAL LITERATURE CLASSIFICATION</p>																			
1ST AND 2ND ORDERS										1ST AND 2ND ORDERS									
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1ST AND 2ND ORDER										PROCESSING AND PROPERTIES INDEX										3RD AND 4TH ORDER									
AFANAS'YEV, P.A.																				18									
<p>Tubular heat exchanger for the contact units of sulfuric acid plants. P. A. Afanas'yev and Z. P. Rozenknop. Russ. 63,672, July 31, 1938. Construction details.</p>																													
ASB-SLA METALLURGICAL LITERATURE CLASSIFICATION																													
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1ST AND 2ND ORDERS										PROCESSES AND PROPERTIES INDEX									
AFANAS'YEV, P.A.																			
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<p>Metallic corrosion in the wood-chemical industry and its control. P. A. Afanas'ev. <i>Lesokhim. Prom.</i> 2, No. 10, 47-56 (1959). <i>Chem. Zentr.</i> 1940, I, 1103. H. E. W.</p>																			
<p>ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION</p>																			
<p>REGION SYMBOLS</p>										<p>REGION SYMBOLS</p>									
<p>GROUPS</p>										<p>GROUPS</p>									

AFANAS'YEV, P.A.		PROCESS AND PROPERTIES INDEX	
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<p>Selection of materials for converters in production of acetic anhydride. P. A. Afanas'ev and A. A. Strepikeev. <i>Korrosiya i Bor'ba s Niz</i>, No. 3, 30-46 (1941). To det. their suitability for use in the manuf. of contact app. for the production of <math>\text{Ac}_2\text{O}</math>, corrosion tests were made on electrolytic Cu, Silumin, 27% Cr steel, 17% Cr steel and 18% Cr, 10% Ni, 0.04% Ti steel, in a current of 80%, <math>\text{AcOH}</math> vapor and 11% <math>\text{H}_2\text{O}</math> at 600°. Wt. loss for the Cu was 1.17 g. per sq. m. per hr. for the first 5 hrs. Silumin was not severely corroded but it deformed greatly and started to melt at 600°, and thus was completely unsatisfactory for the purpose. The 3 steels were practically completely resistant to corrosion under the test conditions; samples exposed to the corrosion test for up to 50 hrs. had practically the same tensile strength and elongation as uncorroded samples; therefore, intergranular corrosion was absent. Approx. catalytic activity of the metals was measured by the vol. of uncondensed gases. The best in this regard was the 27% Cr steel, then Silumin, Cu, 17% Cr steel and finally the 18-8 steel. This order confirmed the theoretical considerations in the literature. J. Z. B.</p>			
<p>ASTM-SLA METALLURGICAL LITERATURE CLASSIFICATION</p>			
<p>190000 191000 192000 193000 194000 195000 196000 197000 198000 199000</p>			

# USSR

Graphite heat-exchange apparatus. P. A. Afanas'ev. *Khim. Prom.* 1954, 164-8.—A nonporous graphite material for chem. app. construction introduced since the war was tested. The material consisted of graphite impregnated with PhOH-HCHO resins. A table is given of the mech. properties of this material, and another table on the chem. resistance to air, acids, bases, halogenes, salt solns., and org. chemicals. Design details are given for a no. of heat-exchange component parts. W. M. Sternberg.

USSR/Chemistry - Heat Exchangers AFANAS'YEV, P. A.

Card 1/1

Author : Afanas'yev, P. A., Cand Tech Sci

Title : Heat exchange equipment of graphite.

Periodical : Khim. prom. 3, 36-40 (164-168), April-May 1954

Abstract : Reports data on graphite impregnated with phenol-formaldehyde resin or "arzamit" and on ATM-1, which does not require any impregnation, discussing the suitability of graphite as a material for the construction of heat exchange equipment used at chemical plants. Particular attention is paid to corrosion resistance. Illustrated by 13 figures. Data are listed in 2 tables. 3 USSR references and 12 foreign references are appended.

Institution : Scientific Research Institute of Chemical Machine Building

AFANASYEV, P. A.

Heat conduct to graphite

1.5 x 10<sup>-3</sup> W/cm<sup>2</sup>

At 1000°C

Graphite

Graphite

Graphite

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SOV/81-59-10-35284

Translation from: Referativnyy zhurnal. Khimiya, 1959, Nr 10, p 274 (USSR)

AUTHORS: Afanas'yev, P.A., Il'in, V.G.

TITLE: Graphite Heat-Exchange Apparatus for Aggressive Media

PERIODICAL: Sb. Kom-t po korrozii i zashchite metallov Vses. sov. nauchno-tekhn. o-v,  
1958, Nr 5, pp 140-163

ABSTRACT: Various designs of heat-exchange apparatus from graphite are described in the article and the characteristic is given of apparatuses made from elements of Field's type, of the "pipe in pipe" type, of a shell-pipe heat-exchanger based on the "falling film" principle, of the block type, etc.

G. Vashin

Card 1/1



COMMON ELEMENTS		COMMON VARIABLES INDEX	
<p>AFANAS'YEV, P.B. CA</p>		<p>PROCEDURES AND PROPERTIES INDEX</p> <p>Spatial distribution of precipitates during crystallization of mutually diffusing substances. P. B. Afanas'ev, Ya. B. Zel'dovich, and O. M. Todes. <i>Zhur. Fiz. Khim.</i> (J. Phys. Chem.) 23, 155-79 (1949).—Equations are derived for the propagation of the zone of pptn. in a flat capillary in which diffusion of 2 compds. takes place in the opposite directions. The rate of propagation depends on the original concns. of the 2 solns., the diffusion coeffs. of the 2 compds., and the soly. product of the ppt. The concns. of the 2 compds. along the capillary also are calcd. J. J. Bikerman</p>	
<p>Inst. Chem. Phys, Dept. Chem. Sci., Acad. Sci.</p>			
<p>450-514 METALLURGICAL LITERATURE CLASSIFICATION</p>		<p>627-777-777</p>	
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PHASE I BOOK EXPLOITATION SOV/5562

Afanas'yev, Pavel Agafonovich

Primeneniye plasticheskikh mass v mashinostroyeni (Utilization of Plastic Materials in Machine Building) Moscow, Mashgiz, 1961. 196 p. Errata slip inserted. 18,000 copies printed.

Ed. of Publishing House: Ya. G. Alaverdov, Engineer; Tech. Ed.: L. P. Gordeyeva; Managing Ed. for Literature on Chemical and Textile Machine Building: V. I. Rybakova, Engineer.

**PURPOSE:** This book is intended for technical personnel engaged in the manufacture of machines for general use and for the chemical industries. It may also be of interest to students of plastics and its applications.

**COVERAGE:** The book contains systematized data on the conversion of polymeric materials into finished products for extensive application in industry. It describes the basic types of plastics and presents data on their composition, structure, and properties. Specifications for each plastic material are given along with descriptions of methods for their conversion into finished articles  
Card-1/4

Utilization of Plastic (Cont.)

SOV/5562

or for their use as protective coatings on metal equipment. Examples of current and future use of plastics in the manufacture of machines are cited. Much of the material concerns the newest plastics, including glass-base plastics, polyamides, vinyl plastics, polyethylene, polypropylene, fluoroethylene, graphite plastics, and graphite impregnated with synthetic resins. The new methods of application of powder plastics to anticorrosion coatings for metals are described in detail. No personalities are mentioned. There are 47 references: 37 Soviet, 9 German, and 1 Czech.

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89594

18.7400 1573, 1454  
1.1800

S/193/61/000/002/004/009  
A005/A004

AUTHORS: Afanas'yev, P.A., Avgustov, Yu.A.

TITLE: Method of Turbulent Spraying of Plastics for the Protection of Metals From Corrosion

PERIODICAL: Byul. tekhn.-ekon. inform., 1961, No. 2, pp. 16 - 19

TEXT: The authors describe the building up of protective coatings by melting on of high-polymeric thermoplastics. The thermoplastic powder is held in a turbulent state by a stream of air or inert gas. The workpiece being coated is preliminarily heated. The necessary equipment consists in the main of a vessel which is open on top has two bottoms: the lower bottom is compact, the upper bottom is made of porous material onto which a layer of the powdery thermoplastics is poured. Compressed air or inert gas is supplied at a controllable pressure into the lower chamber, passes through the porous bottom, and whirls up the thermoplastic powder. The experimental apparatus developed by НИИХИММАШ (NIKhIMMASH) is 400 x 400 mm in cross section. Its lower casing is manufactured of the ordinary St.3 steel, while the upper walls are made of vinyl plastic. The filtering diaphragm consists of two layers of glass tissue embedded between two brass sieves. The

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A005/A004

## Method of Turbulent Spraying of Plastics for the Protection of Metals From Corrosion

poured layer of polyethylene powder should be not less than 100 mm. The air consumption is up to 380 m<sup>3</sup>/m<sup>2</sup>. h, the air pressure is 0.5-6 atm. For the coating of a preheated part by immersing it into the whirling powder, thermoplastics are employed, the decomposition temperature of which is much higher than the melting point, such as polyethylene and polyamides. Moreover, the thermoplastics powder should be free-flouring with an angle of repose of not less than 40°. Bulk materials such as polyethylene whose angle of repose is larger than 50° do not ensure a high-quality coating because the particles form lumps on the part to be coated. It is pointed out that the powder should have the mesh No. 025. The workpiece should be carefully cleaned before processing and preheated up to 250-340°C for LP-polyethylene; the process takes 5-60 sec. The low heat capacity of thin-walled parts does not ensure sufficient coating. Another factor determining the coating thickness is the time of treatment. At 250°C of the preheater and a holding time in the whirling apparatus of 20 sec, the thickness of the polyethylene coat is about 0.6-0.65 mm for a steel part of 10 mm wall thickness, and for 40 sec holding time the coating thickness is 1 mm. The turbulent spraying method has been mastered for a number of polymers such as LP-polyethylene and polyamides. The enclosed diagram show the ratio of component holding time to coating thickness for various tem-

Card 2/5

89594

S/193/61/000/002/004/009  
A005/A004

## Method of Turbulent Spraying of Plastics for the Protection of Metals From Corrosion

peratures. The maximum preheating temperature of the part for polyamide coating is  $370^{\circ}\text{C}$ . Some physical-mechanical properties were compared of coatings obtained on the LP-polyethylene base both by the flame and turbulent spraying methods. The latter method yielded better results: the tensile strength of the film after quenching in cold water is about  $1.54 \text{ kg/mm}^2$  compared to  $1.268$  for flame spraying; the adhesion to the sublayer is  $0.71$  and  $0.425 \text{ kg/mm}^2$  respectively. Coatings of HP-polyethylene are recommended to be cooled carefully in a heated chamber at intermediate temperatures. Polyisobutylene is added to HP-polyethylene to increase the elasticity, while carbon black protects it from UV-radiation. Coatings on the LP-polyethylene base laid on by the whirling method require rapid cooling. The quality of coating increases with the application of an inert gas instead of air for whirling. The addition of fine-dispersed carbon black to LP-polyethylene to decrease the aging rate under UV-radiation somewhat reduces the tensile strength of the coating. The NIIKhimmash carried out tests of metallic specimens protected by polyethylene coatings applied by the whirling method; a 34% hydrochloric acid solution and a 88% sulfuric acid solution at  $40-50^{\circ}\text{C}$  proved over 624 hours the

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89594

S/193/61/000/002/004/009  
A005/A004

Method of Turbulent Spraying of Plastics for the Protection of Metals From Corrosion

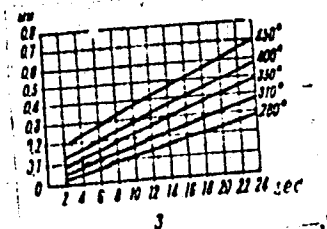
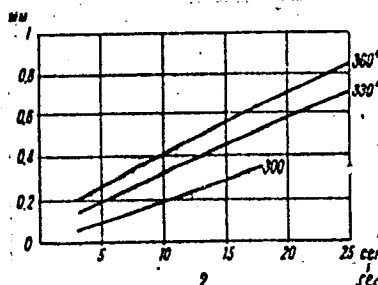
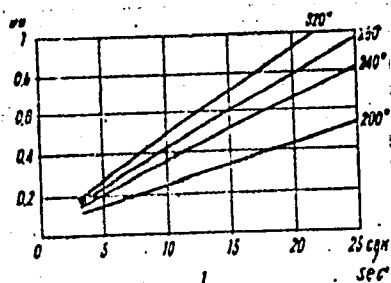
absolute impermeability of the protecting film and the absence of metal corrosion. Tests carried out for 200 hours on 10%-hydrochloric acid and 10%-sulfuric acid under boiling conditions showed no changes of specimens with turbulent sprayed coatings while flame-sprayed coatings showed cracks. When applying polypropylene coatings by the turbulent spraying method, the parts were preheated at 250-300°C and immersed into the whirling powder during 5 - 10 sec; a clear lustrous coating was obtained, whose mechanical properties, such as impact strength and elasticity, were not lower than those of polyethylene coatings.

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S/193/61/000/002/004/009  
A005/A004

Method of Turbulent Spraying of Plastics for the Protection of Metals From Corrosion

Figures: Ratio of component holding time in the boiling powder layer to thickness of coating obtained at various temperatures: 1) material PVD; 2 - material PND; 3 - material polyamide.



Card 5/5



S/852/62/000/000/013/020  
B107/B101

AUTHORS: Afanas'yev, P. A., Avgustov, Yu. A.  
TITLE: Method of whirl-sintering plastic materials to protect  
metals against corrosion  
SOURCE: Primeneniye polimerov v antikorrozionnoy tekhnike. Ed. by  
I. Ya. Klinov and P. G. Udyama. Moscow, Mashgiz, 1962. Vses.  
sovet nauchno-tekhn. obshchestv. 98 - 101

TEXT: The NIIKhIMMASH developed a test apparatus for whirl-sintering. In this technique a pressure of 5 - 6 atm is used to press air or an inert gas through a porous screen. The powdered plastic on the screen behaves like a boiling liquid. Heated objects dipped into it become evenly covered. The most favorable temperature has to be found by experiment. Objects thinner than 1 mm cannot be coated by the whirl-sintering method owing to their low heat content. The device developed by the NIIKhIMMASH has a cross-section of 400 x 400 mm, the screen consists of three glass fabric layers between two brass screens No. 0015. For this method, high-density and low-density polyethylene was used. The former should not be cooled too fast, whereas low-density polyethylene is quenched in cold water. As Card 1/2

Method of whirl-sintering plastic ...

S/852/62/000/000/013/020  
B107/B101

the surfaces obtained with high-density polyethylene are not very good it has to be heated afterwards. Polyethylene coatings are resistant to 34 % hydrochloric acid and 88 % sulfuric acid. Impact strength, tensile strength, bending strength, and adhesion of the coatings have been measured [Abstracter's note: Values are not given]. Experiments proved polypropylene to have poorer mechanical properties. In some respects, the method of whirl-sintering is superior to flame spraying: it yields even coatings on metal objects of complicated shapes and a larger output, with no rejects on account of the plastic overheating. ✓

Card 2/2

L 10708-63

EPR/EWP(j)/EPF(c)/EMP(q)/EWT(m)/HDS--AFFTC/ASD/APGC--Ps-4/Pc-4/

Pr-4--EW/RM/WH/WH/MAY/K/DJ

ACCESSION NR: AP3001647

S/0063/63/008/003/0270/0282

AUTHOR: Afanas'yev, P. A. (Candidate of technical sciences)

TITLE: Graphite as a construction material

SOURCE: Vsesoyuznoye khimicheskoye obshchestvo. Zhurnal, v. 8, no. 3, 1963, 270-282

TOPIC TAGS: graphite, construction material, corrosion resistance, chemical industry.

ABSTRACT: Review of Soviet and foreign literature. The author considers basic raw materials and steps in manufacturing synthetic graphite. Its structure and mechanical properties are described. Methods for impregnating graphite with resins to reduce its porosity are considered. The author discusses the properties and applications of 2 graphite plastics, grafitoplast or material ATM-1 and cast graphite or grafitolite. Among promising new techniques in synthetic graphite the following are considered: production of dilanium graphite; high temperature treatment (1800-2000C); reaction of powdered mixtures of carborundum, Si, and carbon black; and reduction of graphite's porosity by deposition of pure hydrocarbons.

Cord 1/2

L 10708-63

ACCESSION NR: AP3001647

Finally, the author described the various ways in which synthetic graphite and its products may be used in machinery for the chemical industry (heat exchangers, towers with column packing, ejectors and nozzles, pumps and compressors, pipes and pipe fittings, linings for chemical apparatuses, and use as antifriction materials).  
Orig. art. has: 10 tables and 14 figures. 11 16

ASSOCIATION: none

SUBMITTED: 00

DATE ACQ: 01Jul63

ENCL: 00

SUB CODE: 00

NO REF SOV: 018

OTHER: 008

ja/lu  
Card 2/2

USSR/Chemistry - Oxidants

Nov 51

"Experimental Verification of the Theory of Spreading of a Precipitate in a Flat Capillary," P. B. Afanas'yev, O. M. Todes

"Zhur Fiz Khim" Vol XXV, No 11, pp 1273-1280

Following theoretical discussion of subject by above authors and Ye. B. Zel'dovich ("Zhur Fiz Khim" Vol XXIII, No 2, 1949, p 156), proved possibility of use of flat capillary for making quant measurements in case of mutual diffusion of reacting solns. On basis of solns reacting to form difficulty sol salts  $\text{BaCrO}_4$  and  $\text{CuCrO}_4$ ,

196710

USSR/Chemistry - Oxidants (Contd)

Nov 51

verified (a) theoretical calens of rate of movement of pptn product boundary under mutual diffusion of reaction components in flat capillary and (b) existence of boundary of soln of ppt. Under continuous spreading of reaction product ppt, product's rate of crystn has no effect on course of process proceeding purely by diffusion. Describes optical method for keeping surface of capillary strictly horizontal.

196710

USSR/Chemistry - Oxidants

Nov 51

"Distribution of Concentrations of Reaction Components and the Periodic Precipitation of the Product in a Flat Capillary," P. B. Afanas'yev, O. M. Todes

"Zhur Fiz Khim" Vol XXV, No 11, pp 1281-1288

Measurements of diffusion coeff of  $K_2CrO_4$  and concn of int component of reaction in flat capillary under formation of difficult sol reaction product e.g.,  $(CuCrO_4, BaCrO_4)$  provided addnl verification of theory of spreading of ppt and formation of supersatn in front of it.

196711

USSR/Chemistry - Oxidants (Contd)

Nov 51

By theory and expt verified rule of rising geometric progression of distances between layers of ppt under conditions of its periodic distribution. This was shown by expt to be result of relationship between rate of diffusion of reacting components and rate of crystn of reaction product. Authors indicated possible use of diffusion mixing for prepn of definite high supersatns in solns.

196711



L 65035-65

ACCESSION NR: AR5006805

is 1.25 and  $1.20 \times 10^6$  gs-oe, respectively. Nitrogen reduces the critical cooling rate. Composition II has a more uniform structure with a small quantity of fine nitride inclusions.

SUB CODE: MM

ENCL: 00



I-18598-65 EWT(m)/RPF(n)-2/EPR/E-T(t)/RWP(h)  
 ASD(f)-2/BSD/CSE/SOL(t) IL/AN/JG  
 ACCESSION NR: AR4048248

S/0137/64/000/009/I065/I065

SOURCE: Ref. zh. Metallurgiya, Abs. 9I405

AUTHOR: Afanas'yev, P. D.

TITLE: Effect of small additions of silicon and of silicon with niobium and titanium on the magnetic properties of Fe-Ni-Al alloys alloyed with copper

CITED SOURCE: Sb. nauchn. rabot aspirantov L'vovsk. politekhn. in-ta, no. 2, 1963

TOPIC TAGS: Si, Nb, Ti, Cu, Fe-Ni-Al alloy, magnetic property, alloying

TRANSLATION: A comparison of the magnetic properties of alloys with 24% Ni, 10-13% Al, 3.5% Cu, on alloying with 1% Si, 2% Ti, and 2% Nb was made (based on literature data). Introduction of Si increases  $B_r$  by 45% and decreases  $H_c$  by 15% as well as the critical cooling speed; at the same time,  $(BH)_{max}$  does not change. It is recommended to add up to 0.5% Si to alloys with 10% Al to increase  $B_r$ . With an

Card 1/2

L 18596-65

ACCESSION NR: AR4048248

increase of Al up to 13%, the addition of Si should be decreased to 0.3%. Substitution of 2% Ti and 2% Ni in alloys with Cu and Si is not practical. The induction method was employed for control of the magnetic properties with alternating current, making it possible to show the anomaly of the hysteresis loops of the samples after mechanical and heat treatment: in an ammonia atmosphere at 1230° for 3 hrs). In literature titles.

SUB CODE: MM

ENCL: 00

Card 2/2

57528-65 EPA(s)=2/ENT(m)/EWP(w)/EPR(n)=2/EWA(d)/EPR/T/EWP(t)/EWP(z)/  
EWP(b) Pad/PS-4/Pu-4 IUP(-) JD 'EW' 03

ACCESSION NR: AF5015191

UP 1137 40 100 1005 1060/1060

Ush: gen. N. G. Afanas'yev, P. I.

Magnetic properties of iron-nickel-aluminum alloys with additions of silicon, titanium, and columbium

CITED SOURCE: Sb. dokl. na Vses. soveshchaniy po litym splavam dlya postoyan. magnitov, 1962. Saratov, 1964, 55-62

TOPIC TAGS: iron base alloy, nickel containing alloy, aluminum containing alloy, silicon containing alloy, titanium containing alloy

... properties of Al-Fe sys. To increase magnetic energy, 0.3-0.5% silicon should be added. To increase  $H_c$  with an acceptable lowering of  $H_p$ , it is necessary also to add up to 0.5% columbium. Silicon and also titanium (up to 1%) increase the coefficient of curvature of the demagnetization curve,  $\gamma$ . Columbium decreases  $\gamma$ . With introduction of more than 1% titanium,  $\gamma$  increases.

Card 1/2

L 57528 .65

ACCESSION NR: AR5015191

decreases. (From R. Zh. Elektrotekhnika)

AB 2015: MM

ENC 1

Card 2/2